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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/KR2003/000423	International filing date (day/month/year) 05 MARCH 2003 (05.03.2003)	Priority date (day/month/year) 05 MARCH 2002 (05.03.2002)
International Patent Classification (IPC) or national classification and IPC IPC7 A01N 25/02, A01N 25/08, C02F 1/50, C02F 1/76		
Applicant ACCULAB CO., LTD. et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 01 OCTOBER 2003 (01.10.2003)	Date of completion of this report 19 JULY 2004 (19.07.2004)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer WON, Jong Hyeok Telephone No. 82-42-481-5592 

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR2003/000423

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
pages 1-41, 44 , as originally filed
pages _____ , filed with the demand
pages 42-43 , filed with the letter of 01/10/2003
- ☒ the claims:
pages 45-49 , as originally filed
pages _____ , as amended (together with any statement) under Article 19
pages _____ , filed with the demand
pages _____ , filed with the letter of _____
- ☐ the drawings:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____ , as originally filed
pages _____ , filed with the demand
pages _____ , filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed." and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION

International Application No.

PCT/KR2003/000423

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-23	YES
	Claims	None	NO
Inventive step (IS)	Claims	1-23	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-23	YES
	Claims	None	NO

2. Citations and explanations (Rule 70.7)

1) Reference is made to the following documents identified in the International Search Report:

- D1: EP 0427418 A1
- D2: EP 0403465 A1
- D3: US 5688515 A
- D4: WO 2000-64819 A1

2) D1 discloses the use of bromosulfamate as a bactericide and fungicide in a system having a nitrite-containing corrosion inhibitor. And it comprises reacting sodium hypochlorite or chlorine and so on.

D2 discloses a biocidal composition for use in recirculating water systems comprising a hypochlorite donor and a bromide ion donor. Hypochlorite donor is an alkali metal hypochlorite, and alkaline earth metal hypochlorite.

D3 discloses a water stable tablet for recirculating water systems that provides release of hypobromous acid.

D4 discloses a method for sanitizing water which comprises introducing into water sulfamate source from sulfamic acid or a water-soluble sulfamate salt and bromide salt followed by introducing enough oxidant to maintain the concentration.

3) The prior art provides oxidizing biocides by producing hypobromite in advance through prior reaction, meanwhile the subject-matter of claim 1 and claim 20 relates to a method for preparing a biocide and a method for controlling the growth of microorganism comprising the steps of preparing stabilized alkali or alkaline earth metal hypochlorite having a pH at least 11 and preparing a bromide ion source and adding the bromide ion source into the stabilized alkali or alkaline earth metal hypochlorite.

The method of the present invention is accomplished while maintaining the stabilized hypochlorite along with the bromide ion in an unreacted state, thus not producing hypobromite. In doing so, hypochlorite is stabilized using a stabilizer, and bromide ion is then added, giving enhanced durability as well as disinfection efficiency at an initial stage. Thus the method in the present invention is capable of maintaining its biocidal activity for a long time.

Therefore, the subject-matter of claim 1 and claim 20 is not disclosed or suggested in prior art and also is not obvious to a person skilled in the art.

As a consequence, the subject-matter of dependent claims 2 to 19 and 21 to 23 is also novel and inventive and meets the requirements of Article 33(2) and 33(3) PCT.

4) It appears that the claimed subject-matter is industrially applicable.

Therefore, the subject-matter of Claims 1 to 23 meets the requirements of Article 33(4) PCT.

		28.3	9.9				3.59	2.25	1.42	0.31	14.4
		22.0	12.8				5.61	3.47	2.27	2.27	II:
		37.8	12.8				4.39	2.70	1.96	0.49	19.3
		27.4	16.0				6.49	4.16	2.96	1.73	II:
		47.1	16.0				5.33	3.23	2.09	0.57	24.0
				3.2	4.8	0.7	1.25	0.83	0.52	0.20	
				6.4	9.6	9.2	2.24	1.29	0.76	0.19	
				12.8	19.3	2.7	4.87	2.82	1.99	0.87	
				16.0	24.0	23.1	4.84	2.70	1.76	0.55	

Note: I: Addition amount of sodium hypochlorite to water retained in a water system

II: Addition amount of sulfamic acid to water retained in a water system

5 III: Addition amount of sodium bromide to water retained in a water system

TABLE 13

Biocide Concentration (ppm)							Number of Surviving Bacteria (CFU/ml)×10 ³				Remarks (ppm)
I+II	III	II+III	I	I	II	III	5min	1hr	2hrs	24hrs	
										1,500	
8	0.7						1,000	800	600	500	II: 4.8
8	4.6						700	300	200	400	
16	1.4						800	500	300	200	II: 9.6
16	9.2						500	400	100	300	
24	2.0						500	400	300	50	II:
24	13.9						400	400	50	10	14.4
32	2.7						500	500	300	40	II:
32	18.5						400	200	40	20	19.3
40	3.4						400	300	200	10	II:
40	23.1						400	200	20	0.5	24.0
		5.5	3.2				1,300	1,00	900	1,000	II: 4.8
		9.3	3.2				1,000	300	300	800	

		11.0	6.4				1,000	1,000	400	400	II: 9.6
		16.0	6.4				800	500	200	300	
		16.4	9.9				700	400	200	80	II:
		28.3	9.9				500	200	70	100	14.4
		22.0	12.8				300	100	60	30	II:
		37.8	12.8				90	30	10	20	19.3
		27.4	16.0				100	50	10	0.3	II:
		47.1	16.0				50	20	0.5	10	24.0
				3.2	4.8	0.7	1,200	1,000	500	500	
				6.4	6.8	9.2	500	300	200	200	
				12.8	19.3	2.7	200	100	50	20	
				16.0	24.0	23.1	100	50	20	20	

Note: I: Addition amount of sodium hypochlorite to water retained in a water system

II: Addition amount of sulfamic acid to water retained in a water system

5 III: Addition amount of sodium bromide to water retained in a water system

The data in Tables 12 and 13 show an identical pattern to the data from Example 4. When a stabilized sodium hypochlorite solution (I+II) prepared using a stabilizer before addition was added to the pilot cooling tower, the content of total halogen residual was reduced in a slower manner than the case where a mixture solution (II+III) comprising a stabilizer and sodium bromide ion and sodium hypobromite were individually added. Thereby, it was demonstrated that hypochlorite stabilized by sulfamic acid before addition may be more effective than hypochlorite stabilized in the pilot cooling tower. This result is partially due to the rapid loss of highly volatile unstabilized hypochlorite.

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